

PATENT ABSTRACTS OF JAPAN

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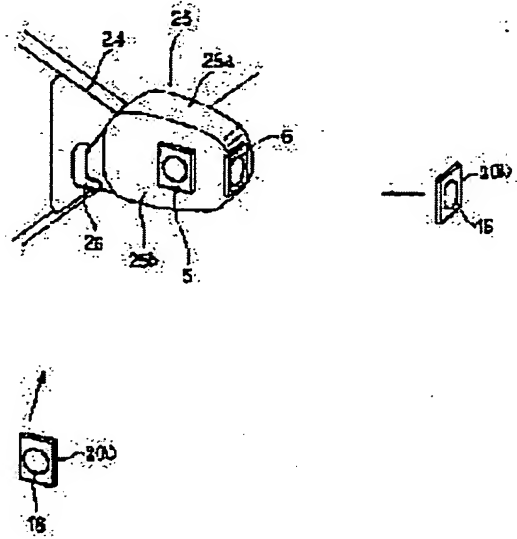
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(54) VEHICULAR COMMUNICATION DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To ensure a stable communication area, regardless of the state of an outer mirror, in a device providing an antenna in an outer mirror.

SOLUTION: In this device, two antenna coils 5, 6 are provided in the housing 25a of an outer mirror 25 while pointing in the front/rear direction and right/left direction. The controller of a vehicular side outputs a magnetic communication signal intermittently and alternately from antenna coils 5, 6 and when a hand holder 2 receives the magnetic communication signal, a control signal is outputted and the controller compares its ID code and controls a door lock mechanism. Even if the outer mirror 25 is stored, as a second antenna coil 6 points in a front/rear direction and the first antenna coil 5 points in right/left direction, a communication area can do without changing. Based on the signal of a storage detection switch, the first antenna coil 5 is made to a preferred antenna when the outer mirror 25 is in use and the second antenna coil 6 is made to the a preferred antenna when it is in storage.



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A(1999)

CLAIMS

[Claim(s)]

[Claim 1] The communication device for vehicles which is a communication device for vehicles which formed the antenna for performing communication between pocket machines in housing of the outer mirror of vehicles, and is characterized by enabling the change of the antenna coil which communicates while constituting the aforementioned antenna from two or more antenna coils which orientation was changed and were prepared in the aforementioned housing.

[Claim 2] The communication device for vehicles according to claim 1 characterized by enabling a setup of the priority antenna with which communication is preferentially performed among two or more aforementioned antenna coils.

[Claim 3] The communication device for vehicles according to claim 2 characterized by setting up a priority antenna according to use of the aforementioned outer mirror, or the state of storing.

[Claim 4] The communication device for vehicles according to claim 1 characterized by changing the antenna coil which communicates according to use of the aforementioned outer mirror, or the state of storing.

[Claim 5] The communication device for vehicles which is a communication device for vehicles which formed the antenna for performing communication between pocket machines in housing of the outer mirror of vehicles, and is characterized by having an angle change means to change the orientation of the antenna coil while constituting the aforementioned antenna from an antenna coil.

[Claim 6] The communication device for vehicles according to claim 5 characterized by changing the orientation of the aforementioned antenna coil by the aforementioned angle change means according to use of the aforementioned outer mirror, or the state of storing.

[Claim 7] It is the communication device for vehicles according to claim 5 or 6 which the aforementioned outer mirror consists of an electric storing formula mirror in which a rotation variation rate is carried out by the rolling mechanism for mirror storing, and

is characterized by interlocking with [rolling mechanism / for mirror storing /
aforementioned] the aforementioned angle change means, and operating.

[Claim 8] The communication device for vehicles which is a communication device for
vehicles which formed the antenna for performing communication between pocket
machines in housing of the outer mirror of vehicles, and is characterized by attaching
the antenna coil in the fixed shaft of housing of the aforementioned outer mirror while
constituting the aforementioned antenna from an antenna coil.

[Claim 9] The communication device for vehicles which is a communication device for
vehicles which formed the antenna for performing communication between pocket
machines in housing of the outer mirror of vehicles, and is characterized by preparing
the bar antenna in a perpendicular state while constituting the aforementioned
antenna from a bar antenna.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the
communication device for vehicles applied to the so-called key loess entry system of
which the door lock was canceled only by the user who possessed the pocket
machine approaching vehicles.

[0002]

[Problem(s) to be Solved by the Invention] In recent years, in the automobile etc., only
by the user (operator) possessing the pocket machine of a card form, so to speak, it is
automatic and the key loess entry system which was made to perform the lock and
lock release of the door of vehicles is considered. In this system, the signal (request
signal) by the magnetic field is outputted to the circumference section of the door of
vehicles, for example by the antenna coil, and if a pocket machine invades in the
magnetic field made into receivable intensity and a request signal is received, it will
output an ID-cord signal by the electric wave.

[0003] And if the ID-cord signal from a pocket machine is received, the controller by
the side of vehicles will collate whether it is in agreement with the registered ID cord,
and will control a door-lock mechanism. If the user who carried the pocket machine
approaches near the door by this, the lock of a door will be canceled automatically,

and when the user who carried the pocket machine separates from an alighting rear door, a door is locked automatically.

[0004] By the way, in this kind of system, it considers preparing the antenna coil for outputting a request signal in housing of an outer mirror (door mirror). However, since this outer mirror generally serves as a collapse formula and an antenna coil has directivity to hand control or it being electric and being repositioned between a busy condition and a storing state, generating of fault from which a communications area (distance) changes is predicted by the state (is it in a busy condition or a storing state?) of an outer mirror.

[0005] this invention was made in view of the above-mentioned situation, and the purpose is in some which form an antenna in housing of an outer mirror, and is irrespective of the state of an outer mirror to offer the communication device for vehicles which can secure the stable communications area by the antenna.

[0006]

[Means for Solving the Problem] The communication device for vehicles of the claim 1 of this invention has the feature in the composition which enabled the change of the antenna coil which communicates while constituting the antenna for performing communication between pocket machines from two or more antenna coils which orientation was changed and were prepared in housing of an outer mirror. According to this, the area which can communicate will increase in number substantially by [with the possible communication by plane of polarization which is different from two or more antenna coils] constituting an angle diversity antenna so to speak, coming, and changing the antenna coil which communicates. Although the orientation in each antenna coil will be changed at this time when the state of an outer mirror is changed, a communications area is changed [be / it / necessary / to make it able to make] as a whole by using each / these / antenna coil properly.

[0007] In this case, it is good also as composition which can set up the priority antenna with which communication is preferentially performed among two or more antenna coils (invention of a claim 2). According to this, more prompt and efficient communication can be performed by setting up an antenna coil with the communications area of the direction which is easy to communicate as a priority antenna.

[0008] Furthermore, a priority antenna can be set up according to use of an outer mirror, or the state of storing (invention of a claim 3). According to this, according to the state of an outer mirror, an antenna coil with the communications area of the direction which is easy to communicate can be automatically set up as a priority antenna.

[0009] Moreover, according to use of an outer mirror, or the state of storing, it can also consider as the composition to which the antenna coil which communicates is changed (invention of a claim 4). According to this, according to the state of an outer mirror, it can communicate using an antenna coil with the communications area of the direction which is easy to communicate.

[0010] The communication device for vehicles of the claim 5 of this invention has the feature at a place equipped with an angle change means to change the orientation of the antenna coil while constituting the antenna formed in housing of an outer mirror from an antenna coil, in order to perform communication between pocket machines. According to this, since the orientation of an antenna coil can be changed by the angle change means, even if it changes the state of an outer mirror, it becomes possible to always set up the communications area by the antenna coil in the direction which is easy to communicate.

[0011] At this time, it can consider as the composition with which the orientation of an antenna coil is changed by the angle change means according to use of an outer mirror, or the state of storing (invention of a claim 6). According to this, according to the state of an outer mirror, the communications area by the antenna coil can be automatically set up in the direction which is easy to communicate.

[0012] Moreover, when the aforementioned outer mirror is an electric storing formula mirror in which a rotation variation rate is carried out by the rolling mechanism for mirror storing, an angle change means can be considered as the composition which is interlocked with the aforementioned rolling mechanism for mirror storing, and operates (invention of a claim 7). According to this, operation of an outer mirror can be interlocked with, an antenna coil can be operated now, method ** of an inclination, as a result the communications area of an antenna coil can be kept constant, moreover a drive can be used also [thing / concerning operation of an outer mirror], and a special drive becomes unnecessary.

[0013] The communication device for vehicles of the claim 8 of this invention has the feature at the place which attached the antenna coil in the fixed shaft of housing of an outer mirror while constituting the antenna formed in housing of an outer mirror from an antenna coil, in order to perform communication between pocket machines. According to this, since the position to the vehicles of an antenna coil is fixation, method ** of an inclination, as a result the communications area of an antenna coil can be kept constant irrespective of the state of an outer mirror.

[0014] The communication device for vehicles of the claim 9 of this invention has the feature at the place which prepared the bar antenna in the perpendicular state while constituting the antenna formed in housing of an outer mirror from a bar antenna, in

order to perform communication between pocket machines. Since a bar antenna is prepared in the state of having indirectivity, i.e., a communications area, equally around horizontally according to this, a communications area can always be kept constant irrespective of the state of an outer mirror.

[0015]

[Embodiments of the Invention] Hereafter, some examples which applied this invention to the so-called key loess entry system of vehicles are explained, referring to a drawing.

(1) Explain the 1st example **** and the 1st example (it corresponds to claims 1-3) of this invention with reference to drawing 1 or drawing 5.

[0016] The key loess entry system as a communication device for vehicles concerning this example is equipped with the controller 1 (refer to drawing 3) formed in the vehicles side, and the pocket machine 2 in which pocket possession is done by the user (operator of vehicles), and is constituted. Drawing 3 shows roughly the electric composition concerning this key loess entry system, and describes the outline of this whole system first.

[0017] The aforementioned controller 1 is constituted considering the control circuit 3 which comes to contain a microcomputer as a center, and two or more antenna coils as an antenna are connected to this control circuit 3 through the transmitting drive circuit 4. In this example, two pieces, the 1st antenna coil 5 and the 2nd antenna coil 6, are prepared. Moreover, the antenna 8 for reception is connected to the control circuit 3 through the RF receiving circuit 7. Furthermore, while the drive circuit 10 which drives the door-lock mechanism 9 is connected, the drive circuit 12 which drives the steirin Grock mechanism 11 is connected to the control circuit 3.

[0018] In housing of the outer mirror (door mirror) of vehicles, the aforementioned antenna coils 5 and 6 change orientation, and are prepared so that it may mention later in detail. And these antenna coils 5 and 6 are controlled by the control circuit 3 possible [a change] through the transmitting drive circuit 4, and output magnetic signal transmission (request signal) by turns intermittently to the circumference section of an outer mirror. In addition, 1 time of a signal is intermittently outputted by the length for several ms – dozens of ms, for example, let this magnetic signal transmission be the frequency of 10MHz of numbers from dozens of kHz.

[0019] Moreover, the aforementioned antenna 8 for reception receives the control signal containing the ID cord outputted from the aforementioned pocket machine 2, and controls the aforementioned door-lock mechanism 9 and the steirin Grock mechanism 11 respectively through the aforementioned drive circuit 10 and the drive circuit 12 based on a control circuit 3 collating the ID cord of the control signal with

the ID cord memorized beforehand etc. at this time, the stearin Grock mechanism 11 is being interlocked with the ignition switch which is not illustrated, and an ignition switch is validated in connection with stearin Grock's being canceled (operation becomes possible) — it is like

[0020] on the other hand, the aforementioned pocket machine 2 is shown in drawing 1 and drawing 2 — as — for example, carrying — it is constituted by the easy card form, and as shown in drawing 3, the control circuit 15 grade which becomes including a receiving circuit 13, the RF sending circuit 14, and a microcomputer is incorporated, and it is constituted The aforementioned receiving circuit 13 is constituted as a resonance circuit which comes to carry out parallel connection of the capacitor 17 to an antenna coil 16, and receives a request signal in the communications area (ready-for-receiving ability range) of the magnetic signal transmission outputted from the aforementioned antenna coils 5 and 6.

[0021] The request input signal from this receiving circuit 13 is inputted into the aforementioned control circuit 15 through a rectifier circuit 18 and a transistor 19. And a control circuit 15 outputs the control signal containing the peculiar ID cord beforehand remembered that a request input signal is inputted as an electric wave signal from the antenna 20 for transmission through the aforementioned RF sending circuit 14.

[0022] Moreover, two operation keys 21 and 22 for operating the door-lock mechanism 9 and the stearin Grock mechanism 11 are formed in this pocket machine 2, and the manipulate signal of these operation keys 21 and 22 is inputted into it through an input circuit 23 at the aforementioned control circuit 15. Even if a control circuit 15 is based on the signal of these operation keys 21 and 22, it outputs a control signal from the aforementioned antenna 20 for transmission. In addition, in the pocket machine 2, the cell used as a power supply which is not illustrated is incorporated.

[0023] By the above-mentioned composition, if the pocket machine 2 (possessor of the pocket machine 2) invades into the ready-for-receiving ability range of the magnetic signal transmission near the vehicles (outer mirror) (or ready-for-receiving ability range existence), the pocket machine 2 (control circuit 15) will output the control signal which contains an ID cord from the antenna 20 for transmission in response to a request signal. And if the antenna 8 for reception receives the control signal from the pocket machine 2, the controller 1 (control circuit 3) by the side of vehicles is collated with the registered ID cord, will control the stearin Grock mechanism 11 and will cancel stearin Grock while it controls the door-lock mechanism 9 and cancels a door lock, when in agreement. Furthermore, if the possessor of the pocket machine 2 gets off and separates from a door for example, after an engine

shutdown, a door lock and steering lock will be made automatically.

[0024] Now, drawing 1 and drawing 2 show the outer mirror (door mirror) 25 prepared in the body (door frame) 24 of the driver's side of vehicles. This outer mirror 25 is equipped with the angle regulatory mechanism (not shown) for adjusting the angle of the aforementioned mirror main part 25b in the aforementioned housing 25a, and is constituted by front opening of the housing 25a which makes rectangle box-like mostly while having mirror main part 25b. Let this outer mirror 25 be an electric storing formula mirror in this example.

[0025] Namely, this outer mirror 25 (housing 25a) while being attached possible [rotation] centering on the almost perpendicular shaft through the fixed shaft 26 to the body 24. A rotation variation rate is carried out between the storing states (refer to drawing 2) moved to the near side about 90 degrees so that the body 24 might be met by the well-known rolling mechanism for mirror storing (not shown) from the busy condition (refer to drawing 1) projected from the body 24 to the side, and its busy condition. Moreover, the aforementioned rolling mechanism for mirror storing comes to have the storing detection switch 27 (to refer to drawing 3) with which the outer mirror 25 detects having changed into the storing state, and the signal of this mirror storing switch 27 is inputted also into the control circuit 3 of the aforementioned controller 1.

[0026] And in housing 25a of this outer mirror 25, the aforementioned antenna coils 5 and 6 are arranged. The mould of them is carried out with an insulating resin, and both these antenna coils 5 and 6 are constituted by the rectangle tabular while they wind a coil line circularly and change. At this time, the 1st antenna coil 5 of the above is formed in the position where it is prepared in the core inner in housing 25a in so that it may become parallel to a mirror side, and the 2nd antenna coil 6 consisted the angle of about 90 degrees in it at the point in housing 25a, and the 1st antenna coil 5 estranged magnetic field interference to some extent to it to avoid as much as possible.

[0027] A deer is carried out, antenna coils 5 and 6 have directivity, and the magnetic field strength of a hoop direction has become [the magnetic field strength of shaft orientations] strong (a communications area is large) weakly (a communications area is narrow) compared with it. Therefore, as shown in drawing 1 , in the busy condition of the outer mirror 25, the 1st antenna coil 5 which turns to a cross direction is confirmed to the pocket machine 2 (A) which approaches from a cross direction (highly sensitive), and the 2nd antenna coil 6 which turns to a longitudinal direction is confirmed to the pocket machine 2 (B) which approaches from the side (highly sensitive).

[0028] And since it will be in the state where the 2nd antenna coil 6 turns to a cross direction, and the 1st antenna coil 5 turns to a longitudinal direction shortly even if the outer mirror 25 is made into a storing state as shown in drawing 2 , even if the state of the outer mirror 25 is which, most communications areas by antenna coils 5 and 6 are changed [be / it / necessary / to make it able to make] as a whole.

[0029] Here, in case considering the operating condition of common vehicles it gets in vehicles in a parking lot etc., there is a situation than which a user approaches more often from a cross direction to vehicles (outer mirror 25). Although the control circuit 3 of the aforementioned controller 1 performs control which outputs magnetic signal transmission (request signal) by turns from both antenna coils 5 and 6 as mentioned above, it sets up automatically the priority antenna with which communication is performed preferentially in this example.

[0030] That is, drawing 4 shows the change pattern of the antenna coils 5 and 6 in case the outer mirror 25 is in a busy condition, and the 1st antenna coil 5 is used as a priority antenna, and it outputs 1 time of magnetic signal transmission from the 2nd antenna coil 6 here to two outputs of magnetic signal transmission from the 1st antenna coil 5. And as this priority antenna is changed according to the state of the outer mirror 25 and is shown in drawing 5 , when the storing signal of the outer mirror 25 is inputted from the storing detection switch 27, let the 2nd antenna coil 6 be a priority antenna shortly.

[0031] Next, an operation of the above-mentioned composition is described. As mentioned above, in the vehicles parked, for example at the parking lot, magnetic signal transmission is intermittently outputted from the antenna coils 5 and 6 built in the outer mirror 25. If a user possesses the pocket machine 2 and invades in the communications area (ready-for-receiving ability range) of these antenna coils 5 and 6, communication will be performed between the pocket machine 2 and the controller 1 by the side of vehicles. And so to speak, the door-lock mechanism 9 and the steering lock mechanism 11 are automatically controlled by the controller 1, and a user can perform the receipts and payments to vehicles etc., without performing a troublesome key stroke. In addition, when the pocket machine 2 transmits a control signal in response to a request signal, in order to avoid magnetic field interference, the output of the request signal from antenna coils 5 and 6 is suspended temporarily.

[0032] At this time, the case where a user (pocket machine 2) approaches from a cross direction to vehicles (outer mirror 25), and the case where it approaches from the side can be considered. Here, when the pocket machine 2 receives the magnetic signal transmission from the 1st antenna coil 5 when the outer mirror 25 is in the busy condition shown in drawing 1 and a user approaches from a cross direction, a user

approaches from the side to vehicles and the pocket machine 2 receives the magnetic signal transmission from the 2nd antenna coil 6, highly sensitive communication can be performed by any case. Moreover, since the 1st antenna coil 5 was used as the priority antenna in this state, when the pocket machine 2 considered that frequency is more high approaches from a cross direction, efficient communication is performed and door-lock mechanism 9 grade comes to be promptly controlled by this example.

[0033] On the other hand, although the user may be changing the outer mirror 25 into the storing state at the time of the last alighting When the outer mirror 25 is in the storing state shown in drawing 2 When the pocket machine 2 receives the magnetic signal transmission from the 2nd antenna coil 6 when a user approaches from a cross direction, and a user approaches from the side to vehicles When the pocket machine 2 receives the magnetic signal transmission from the 1st antenna coil 5, highly sensitive communication can be performed by any case. Moreover, when the outer mirror 25 is in a storing state in this way, by the detection signal of the storing detection switch 27, the 2nd antenna coil 6 is used as a priority antenna, and communication when the pocket machine 2 approaches from a cross direction too is prompt, and is performed efficiently.

[0034] Thus, since according to this example orientation is changed and two antenna coils 5 and 6 were formed in housing 25a of the outer mirror 25, the area which can communicate can be increased substantially. And if the state of an outer mirror is changed, unlike the conventional thing to which a communications area is changed, irrespective of the busy condition or storing state of the outer mirror 25, the communications area by antenna coils 5 and 6 can be made equivalent, and the outstanding effect that the stable communications area is securable will be done so.

[0035] And since the antenna coils 5 and 6 with the communications area of the direction which is especially easier to communicate by this example were set up as a priority antenna, more prompt and efficient communication can be performed. Furthermore, in this example, since the priority antenna was automatically changed according to use of the outer mirror 25, or the state of storing especially based on the signal of the storing detection switch 27, it shall much more be easy to use.

[0036] (2) The 2nd and 3rd example drawing 6 shows the 2nd example (it corresponds to a claim 4) of this invention. The place where this example differs from the 1st example of the above is in the point which changed the antenna coils 5 and 6 to be used completely based on the detection signal of the storing detection switch 27 while communicating by one of the antenna coils 5 and 6 rather than outputting magnetic signal transmission (request signal) by turns from two antenna coils 5 and 6 (output of magnetic signal transmission).

[0037] That is, that the communications area of a cross direction should be made large, when the outer mirror 25 is in a busy condition, the 1st antenna coil 5 is confirmed, and as mentioned above, since it approaches more often from a cross direction to the outer mirror 25 in case a user gets in vehicles, when the outer mirror 25 is in a storing state, the 2nd antenna coil 6 is confirmed. According to this composition, according to the state of the outer mirror 25, it can communicate using the antenna coils 5 and 6 with the communications area of the direction which is easy to communicate, and the stable communications area can be secured.

[0038] Drawing 7 shows the 3rd example of this invention. It is made to output magnetic signal transmission (request signal) by turns from two antenna coils 5 and 6 in this example irrespective of in any the outer mirror 25 shall be between a busy condition and a storing state. According to this, by two antenna coils 5 and 6, the area which can communicate can be increased substantially, the communications area by antenna coils 5 and 6 can be made equivalent irrespective of the busy condition or storing state of the outer mirror 25, and the stable communications area can be secured. Moreover, in this case, storing detection switch 27 grade becomes unnecessary, and can be applied also to the thing of the type with which a user changes the state of the outer mirror 25 manually.

[0039] In addition, although two antenna coils 5 and 6 were formed in the above 1st – the 3rd example, when orientation is changed mutually, and you may make it prepare three or more antenna coils and it sets up a priority antenna like the 1st example of the above, a priority antenna configuration switch is prepared and it is good also as composition in which the manual setting by the user is possible.

[0040] (3) Explain the 4th example, next the 4th example (it corresponds to claims 5 and 6) of this invention, referring to drawing 8 and drawing 9 . In addition, also in the example described below, since it is common in the 1st example of the above about the fundamental composition of a key loess entry system, while omitting new illustration and detailed explanation about the portion which is common in the 1st example of the above, a sign is used in common, and a different point is described hereafter.

[0041] In this example, one antenna coil 31 is formed in housing 25a of the outer mirror 25. The mould of it is carried out with an insulating resin, and this antenna coil 31 is constituted by the rectangle tabular, and is prepared in the rotatable (change of orientation is possible) centering on the shaft mostly prolonged perpendicularly in housing 25a while it winds a coil line circularly and changes.

[0042] And in housing 25a of the outer mirror 25, the angle change means slack rolling mechanism 32 is established. This rolling mechanism 32 consists of a gear mechanism

34 in which the turning effort of a motor 33 and this motor 33 is transmitted to the aforementioned antenna coil 31, and it is constituted so that an antenna coil 31 may be rotated to the outer mirror 25 and the orientation may be changed by the drive of the aforementioned motor 33. Although illustration is not carried out, the aforementioned motor 33 is controlled by the aforementioned controller 1 (control circuit 3) through a drive.

[0043] The field of mirror main part 25b is made to stop an antenna coil 31 mostly in this example, in the position it turns [position] to the cross direction of parallel, i.e., the body, as a controller 1 controls a rolling mechanism 32 (motor 33) based on the detection signal of the storing detection switch 27 of the outer mirror 25, and it shows it to drawing 8 , when the storing detection switch 27 is [OFF 25, i.e., an outer mirror,] a busy condition at this time. On the other hand, when ON 25, i.e., an outer mirror, rotates in the direction of arrow C by drawing 8 and it is made into a storing state, the storing detection switch 27 stops the cross direction of the body too in the position to turn to, as opposite direction (it is the direction of arrow D at drawing 8) is rotated about 90 degrees with it and an antenna coil 31 is shown in drawing 9 .

[0044] Since according to this composition an antenna coil 31 is made into the state of turning to a cross direction and being always easy to communicate it and a communications area is not changed even if the outer mirror 25 is repositioned between a busy condition and a storing state, the stable communications area by the antenna coil 31 is securable irrespective of the state of the outer mirror 25. Moreover, since one antenna coil 31 is only formed in the outer mirror 25, while composition is easy compared with the case where more than one are prepared and being able to plan the formation of a ** space, and cost **, problems, such as magnetic field interference of antennas, do not arise.

[0045] (4) The 5th example drawing 10 shows the 5th example (it corresponds to a claim 7) of this invention. In housing 25a of the outer mirror 25 which consists of an electric storing formula mirror, one antenna coil 41 is formed through the axis of rotation 42 prolonged mostly perpendicularly at the rotatable (change of orientation is possible). Moreover, in housing 25a, the rolling mechanism 43 for mirror storing is established. This rolling mechanism 43 for mirror storing operates by operating the switch which was formed in in the car and which is not illustrated.

[0046] the fixed shaft 26 with which this rolling mechanism 43 for mirror storing has attached the outer mirror 25 in the body 24 — the rotation center of the outer mirror 25 — being located — the fixed gear 44 — being fixed (nonrotation state) — while attaching, it is located in the right-hand side drawing, and the drive gear 46 attached in output-shaft 45a of the motor 45 fixed to the housing 25a side is prepared and

constituted so that it may gear with the aforementioned fixed gear 44. Now, if the drive gear 46 rotates by the motor 45, the drive gear 46, as a result a motor 45 circle in the circumference of the fixed gear 44 about 90 degrees, it will have and the outer mirror 25 will rotate between a busy condition and a storing state.

[0047] And at this time, it was located in right-hand side in drawing of the aforementioned drive gear 46, and the follower gear 47 prepared in the aforementioned axis of rotation 42 meshes in the position opposite to an engagement position with the aforementioned fixed gear 44 180 degrees, with an angle change means for the rolling mechanism 43 for mirror storing to be interlocked with, and to operate consists of this examples. In this case, it considers as the state where output-shaft 45a of the axial center (rotation center of the outer mirror 25) of the fixed gear 44 and a motor 45 and the axis of rotation 42 were located in a line in a straight line (it is a longitudinal direction in drawing), and let altogether the aforementioned fixed gear 44, the drive gear 46, and the follower gear 47 be the same numbers of teeth.

[0048] Thereby, in the busy condition of the outer mirror 25, like illustration, the aforementioned antenna coil 41 is attached so that a cross direction may be turned to to the axis of rotation 42. And if the outer mirror 25 rotates from this state to a storing state as mentioned above, the follower gear 47 will circle about 90 degrees, circling rotating to the drive gear 46 and maintaining the orientation of an antenna coil 41. Therefore, an antenna coil 41 will turn to a cross direction too also in the state of storing of this outer mirror 25. In case the outer mirror 25 rotates from a storing state to a busy condition, operation contrary to it is performed and orientation of an antenna coil 41 is too left intact.

[0049] Thus, according to this example, like the 4th example of the above, even if the outer mirror 25 is repositioned between a busy condition and a storing state, since a cross direction is made into the state of it being suitable and being easy to communicate and a communications area is not changed, an antenna coil 41 can secure the stable communications area by the antenna coil 41 irrespective of the state of the outer mirror 25. And in addition to this, the drive of an antenna coil 41 can be used also [mechanism / mirror storing leisure transfer / 43 / in which the outer mirror 25 is rotated] in part, and simplification of composition -- a special driving source (motor) becomes unnecessary -- can be attained.

[0050] (5) The 6th example drawing 11 and drawing 12 show the 6th example (it corresponds to a claim 8) of this invention. It is made to attach one antenna coil 51 prepared in housing 25a of the outer mirror 25 in this example, so that it may turn [point / of the fixed shaft 26] to a cross direction.

[0051] Since according to this (referring to drawing 12) and the position to the vehicles of an antenna coil 51 are fixation when the outer mirror 25 is in an operating position, and when it is in (refer to drawing 11) and a storing position, method ** of an inclination, as a result the communications area of an antenna coil 51 can always be kept constant irrespective of the state of the outer mirror 25. Moreover, since the drive etc. is unnecessary, very easy composition can be managed. Furthermore, a user can apply also to the thing of the type which changes the state of the outer mirror 25 manually.

[0052] (6) Drawing 13 and drawing 14 show the 7th example (it corresponds to a claim 9) of this invention to the 7th example last. It replaces with the thing using the antenna coil like each above-mentioned example as an antenna formed in the outer mirror 25, and is made to adopt the ferrite bar antenna 61 in this example. And it is made to form this ferrite bar antenna 61 in a perpendicular state mostly.

[0053] Since the ferrite bar antenna 61 is formed in the state of having indirectivity, i.e., a communications area, equally around horizontally according to this, a communications area can always be kept constant irrespective of the state of the outer mirror 25. moreover . While being able to manage easy composition, the advantage that the ferrite bar antenna 61 can be arranged also in the comparatively narrow portion in the outer mirror 25 is also acquired. Of course, it is applicable also to the thing of the type with which a user changes the state of the outer mirror 25 manually.

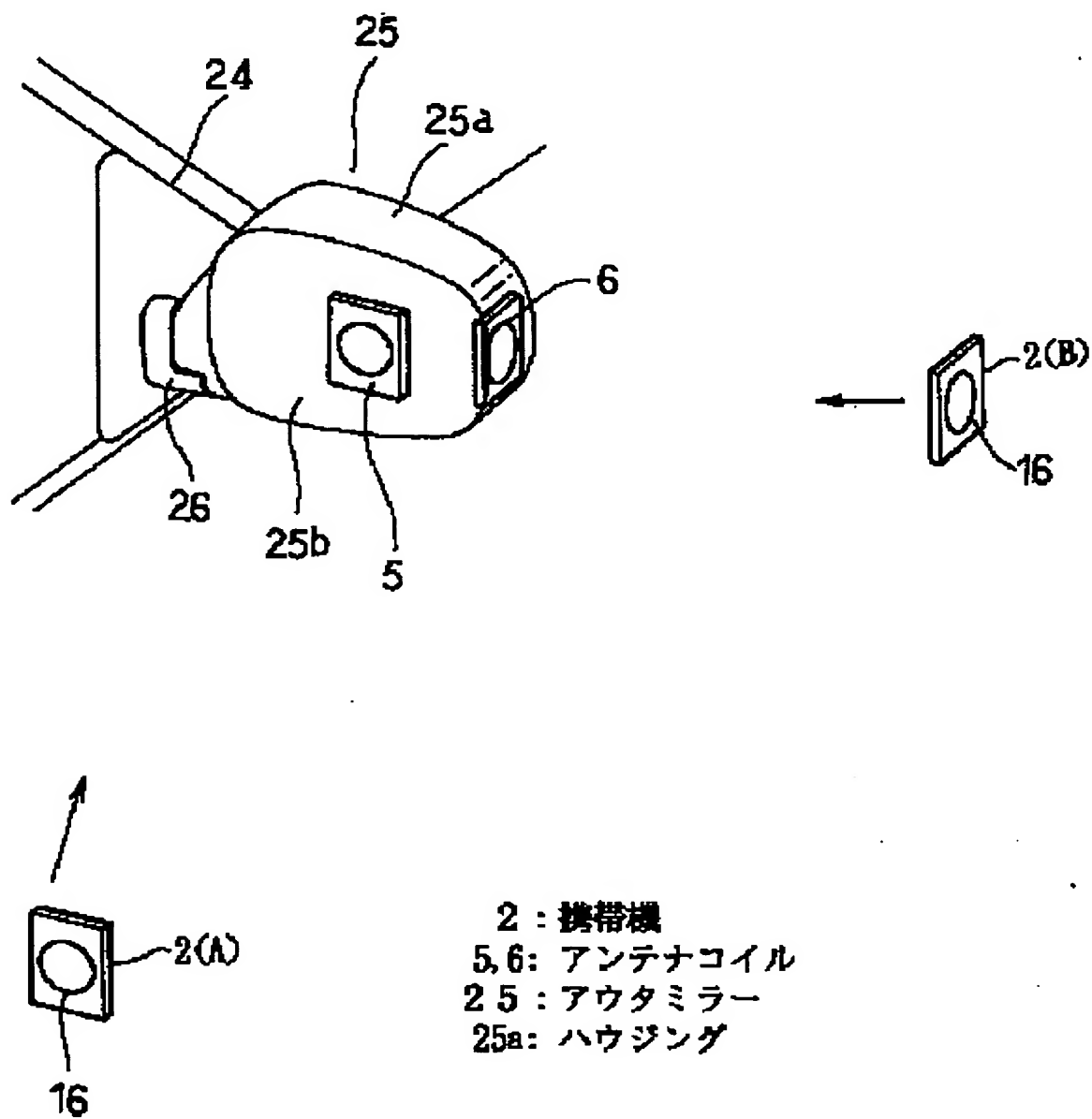
[0054] in addition, the various change also as composition of a controller 1 or the pocket machine 2 is [that what is necessary is not to be limited to each above-mentioned example, and just to constitute so that it may point to the direction which is the easiest to communicate not only in a cross direction about direction of an antenna coil] possible for this invention --- etc. --- it can carry out by changing suitably within limits which do not deviate from a summary

[0055]

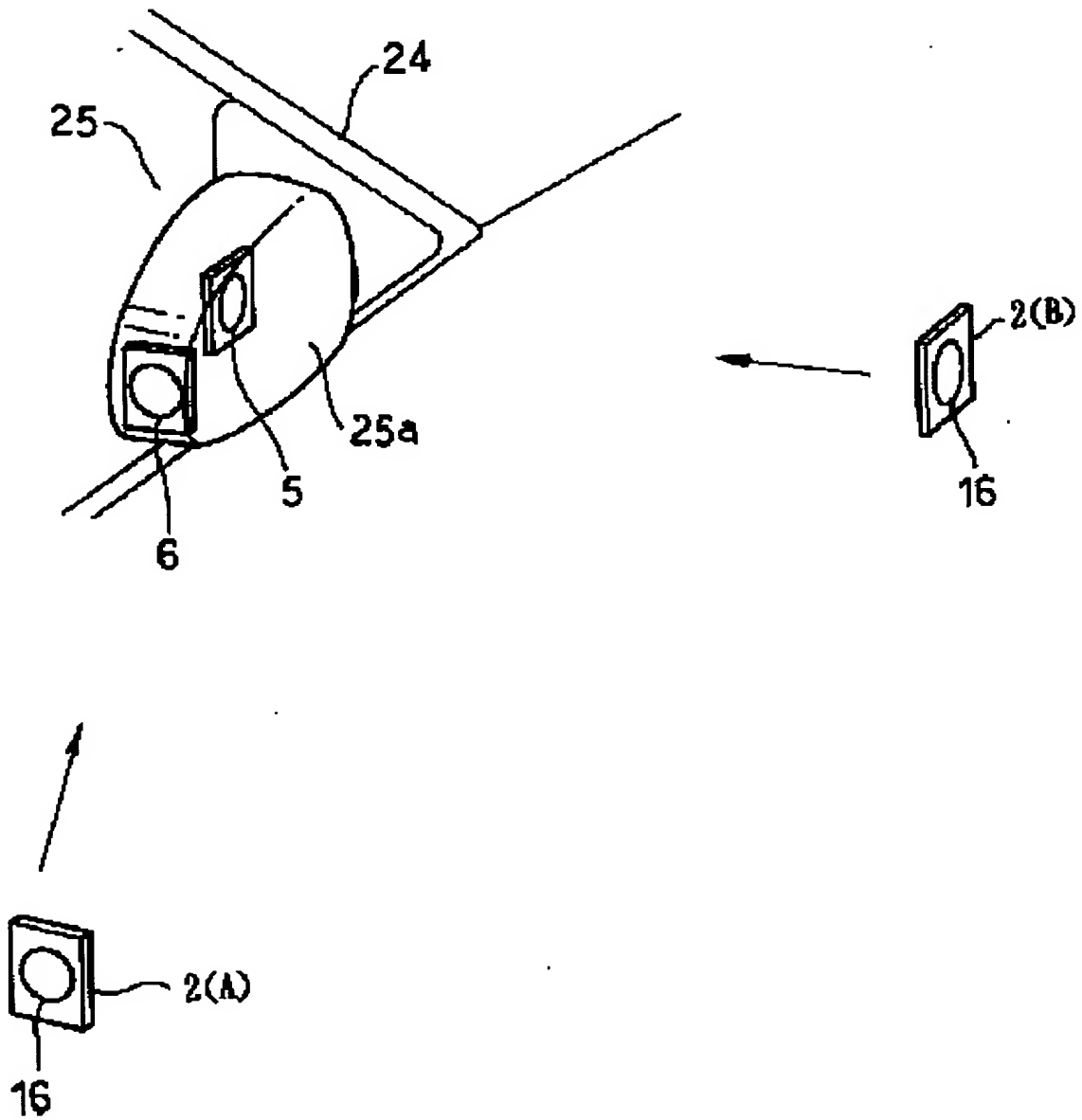
[Effect of the Invention] the above explanation -- ** -- according to the communication device for vehicles of this invention, it is in some which form an antenna in housing of an outer mirror, a communications area can be kept constant irrespective of the state of an outer mirror, and the outstanding effect that the stable communications area by the antenna is securable is done so that clearly

DRAWINGS

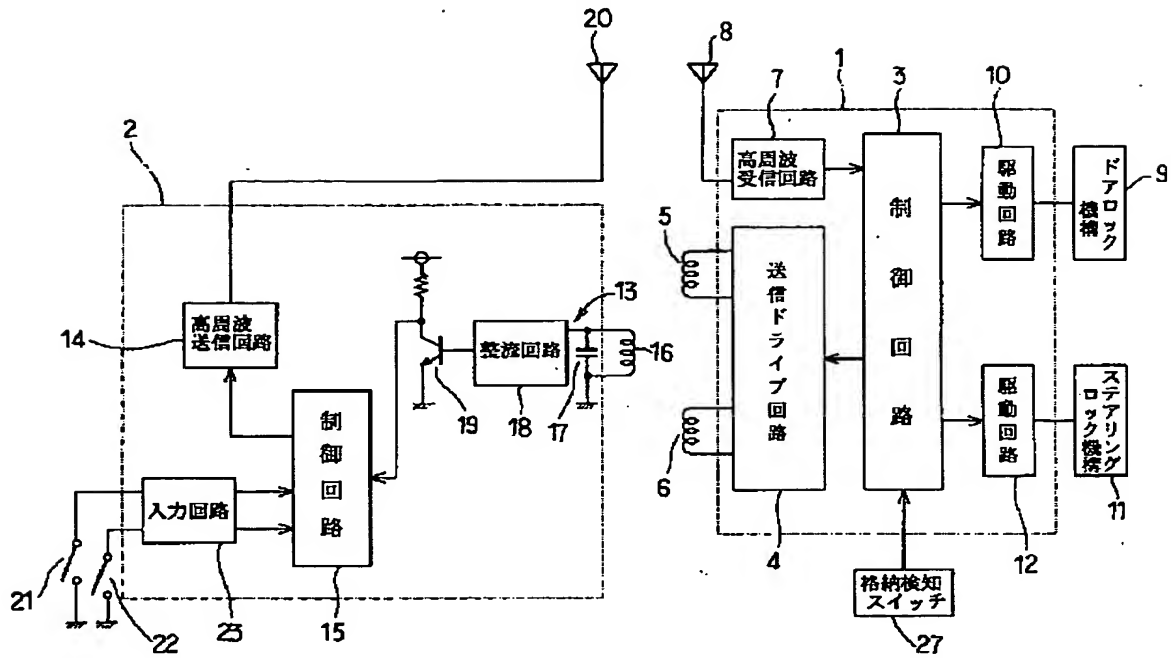
[Drawing 1]



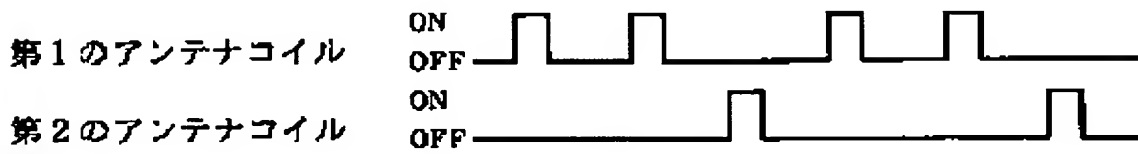
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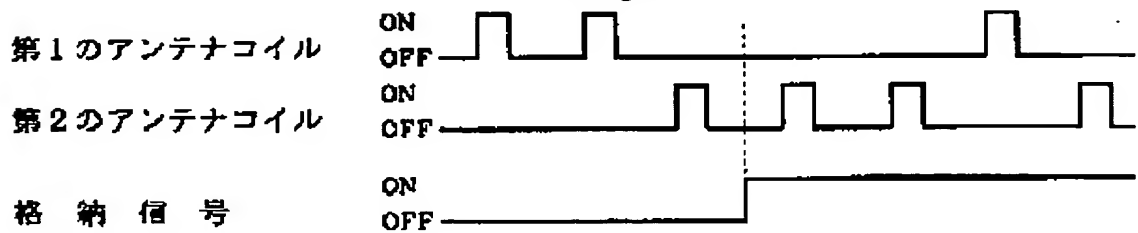
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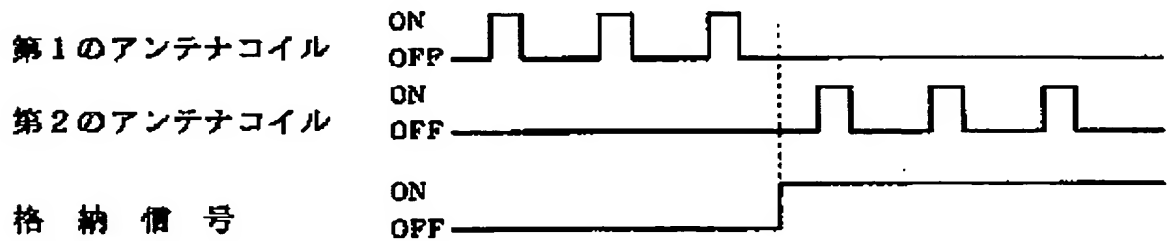
[Drawing 4]



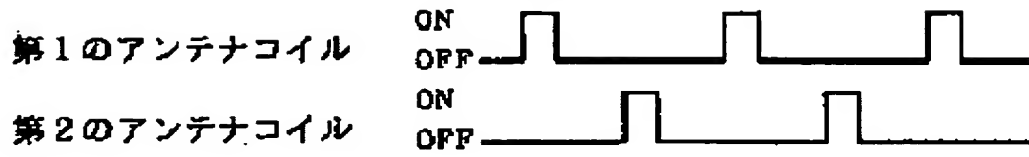
[Drawing 5]



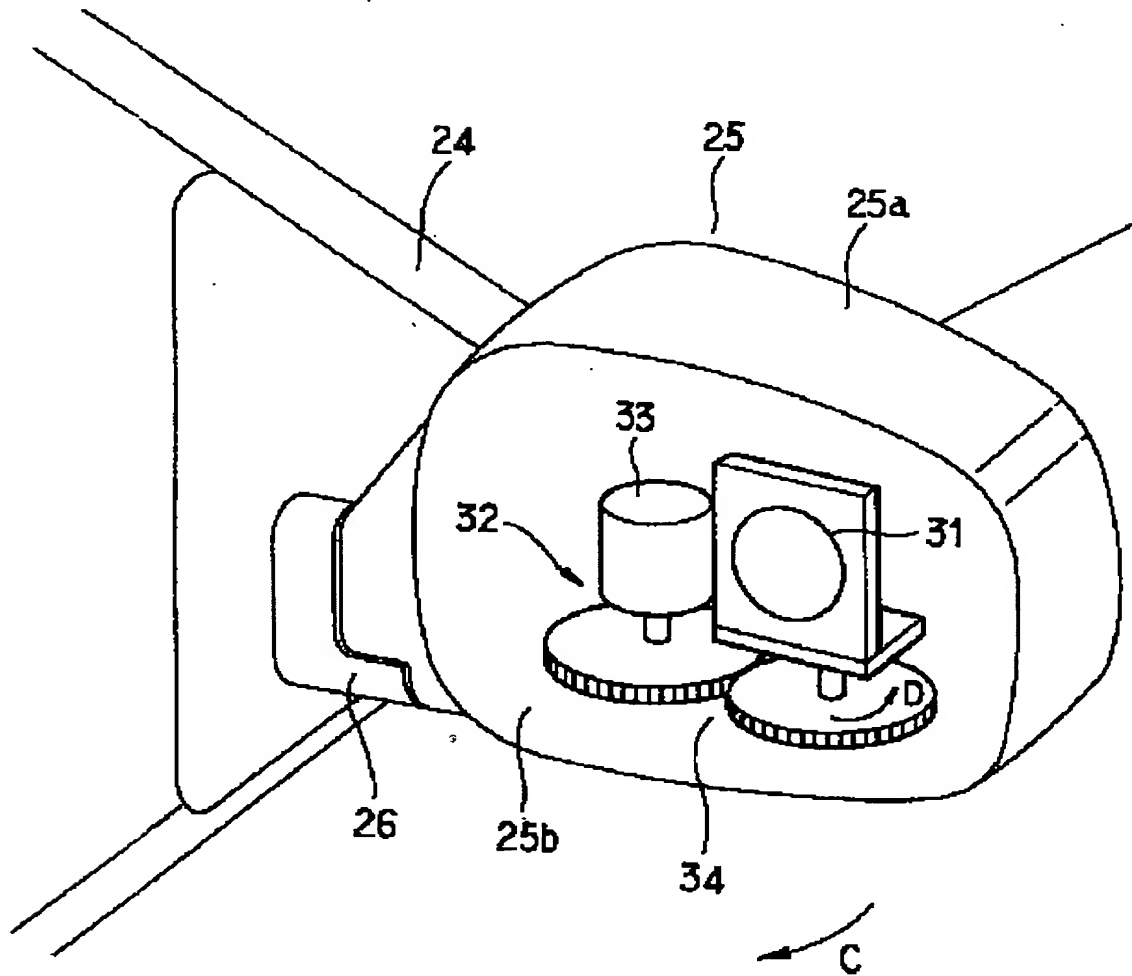
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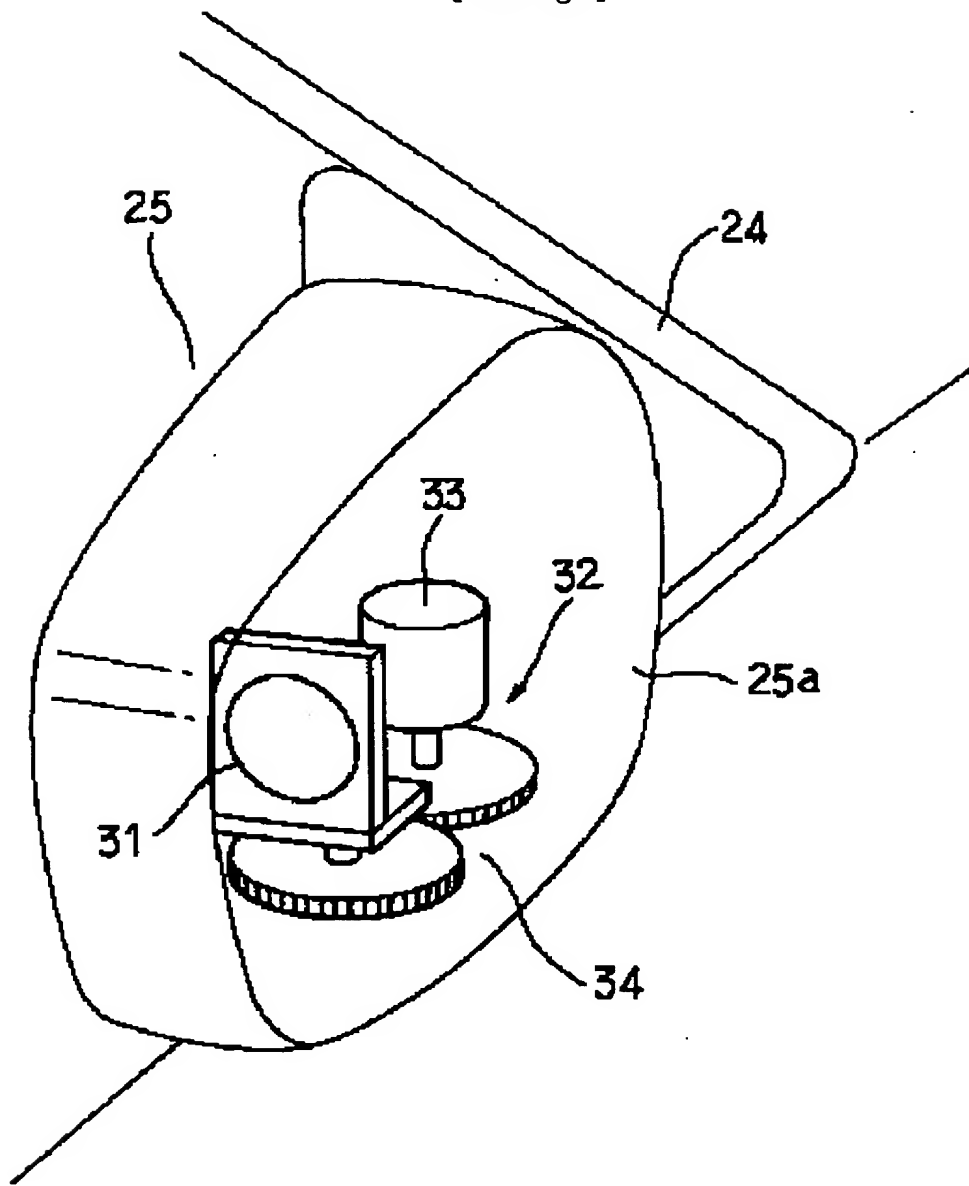
[Drawing 7]



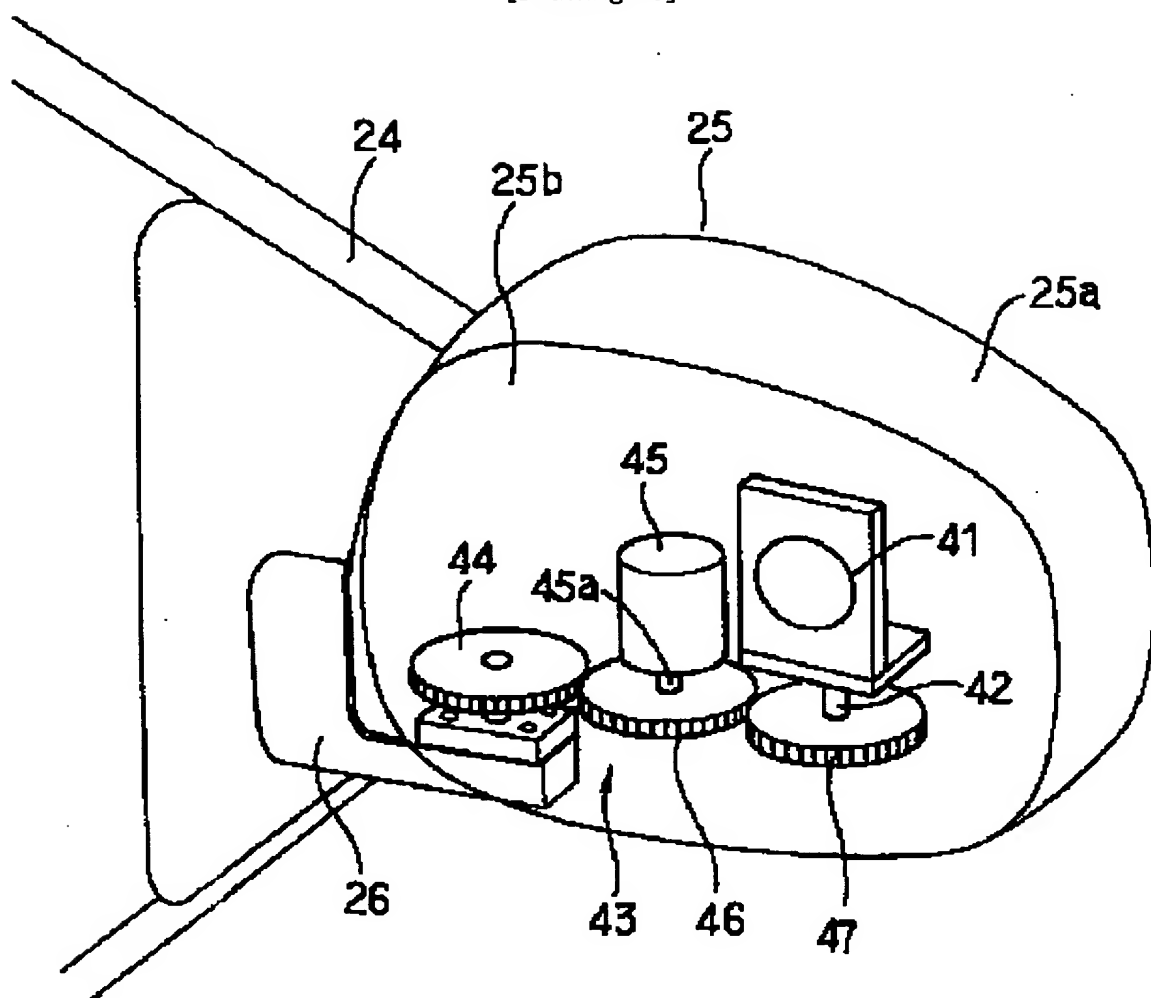
[Drawing 8]



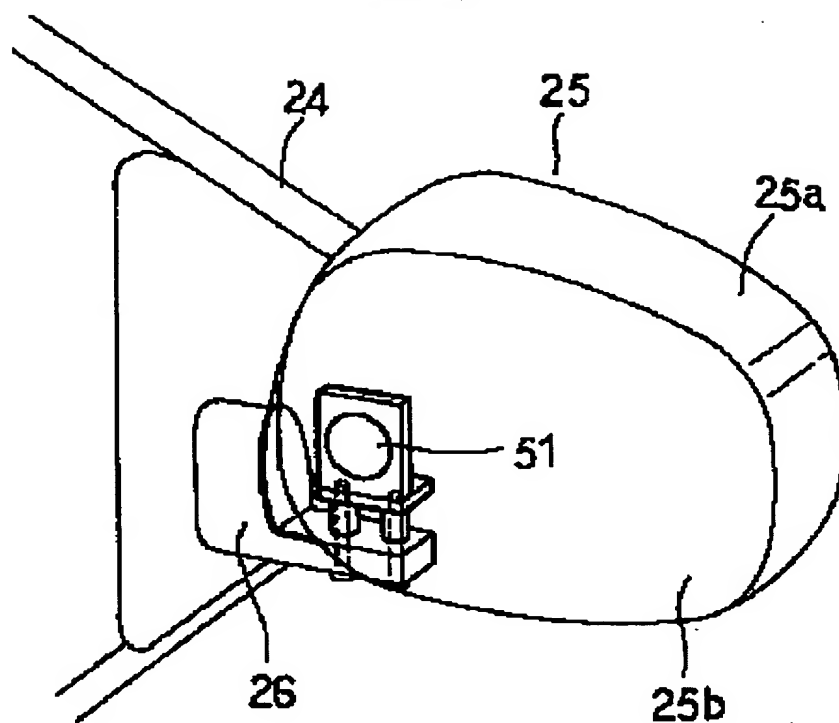
[Drawing 9]



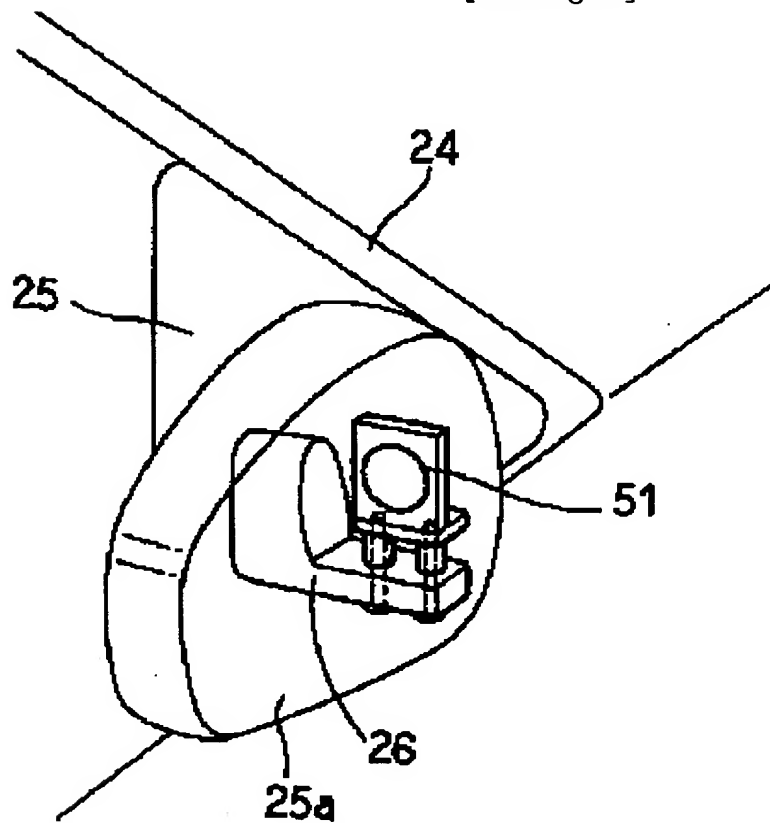
[Drawing 10]



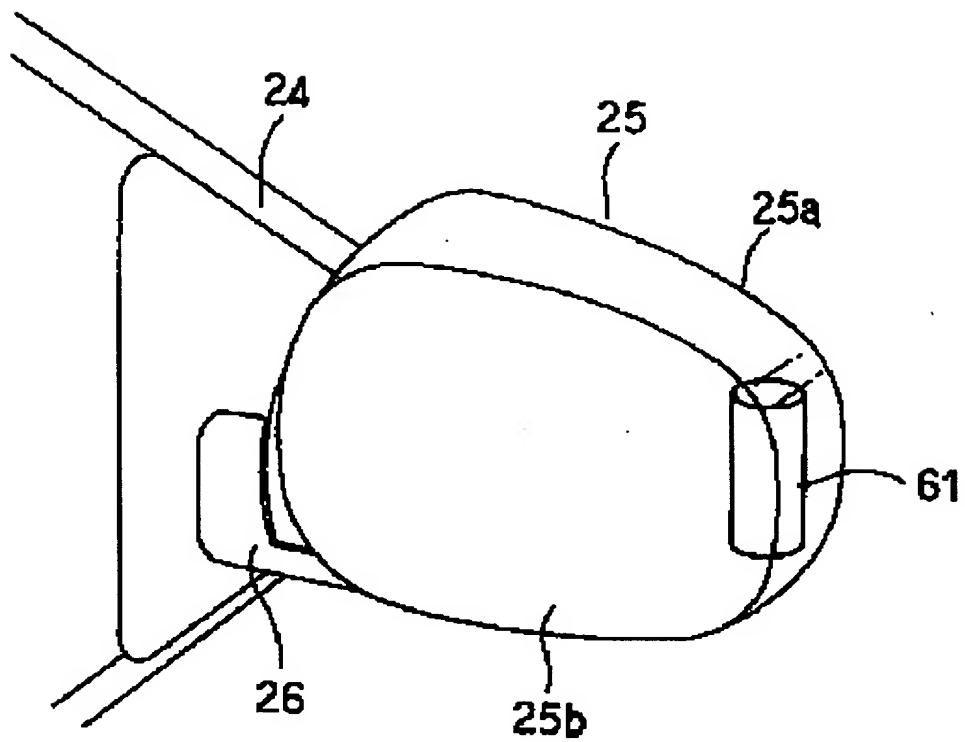
[Drawing 11]



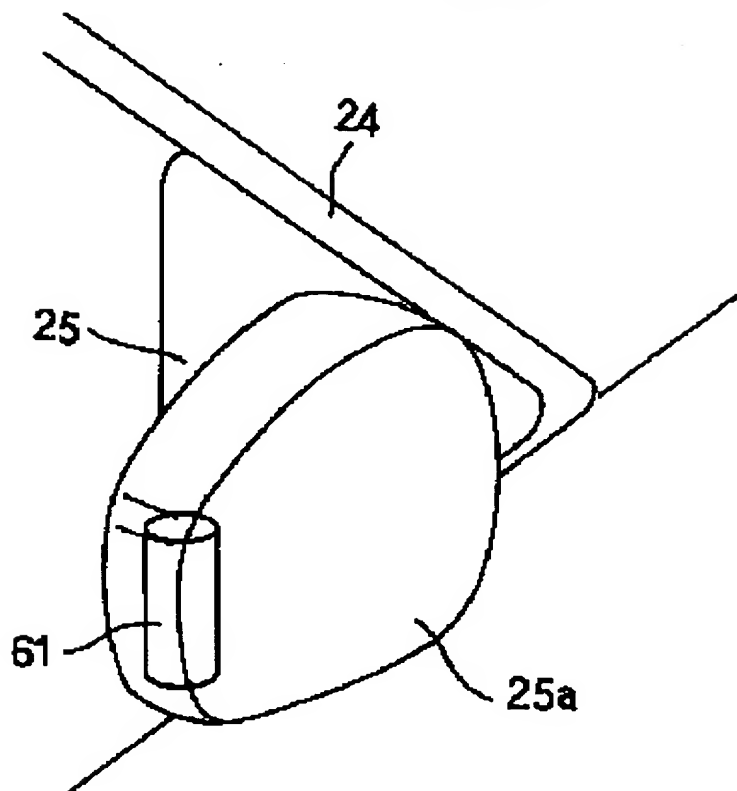
[Drawing 12]



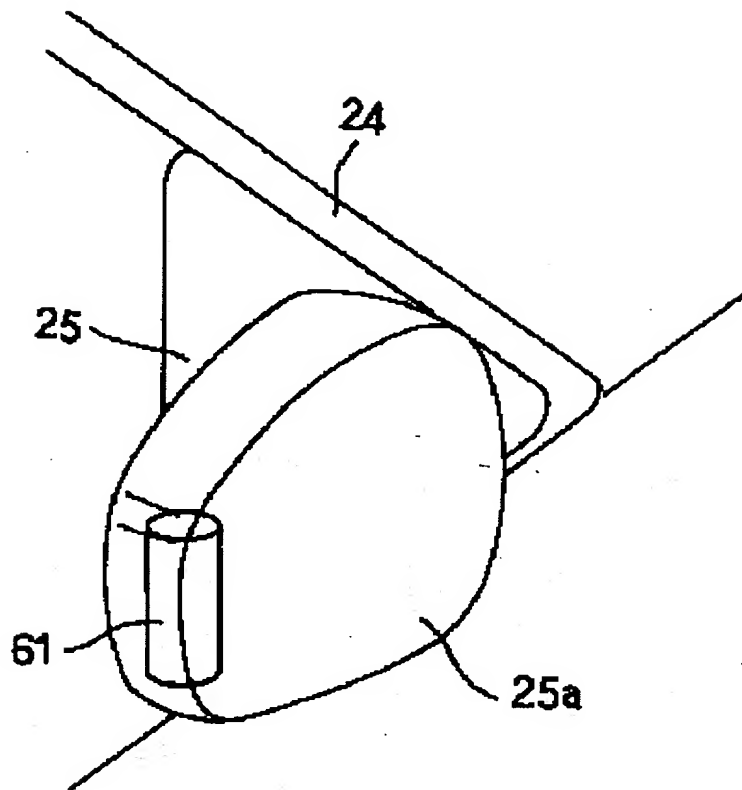
[Drawing 13]



[Drawing 14]



[Drawing 14]



DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is flat-surface explanatory drawing which showed the 1st operation gestalt of the circumference check equipment for automobiles of this invention, and expressed the check range.

[Drawing 2] It is side explanatory drawing showing the check range.

[Drawing 3] It is the side elevation of door mirror equipment and the circumference check equipment for automobiles of this invention.

[Drawing 4] It is the side elevation of the circumference check equipment for automobiles of this invention in the state where covering was removed.

[Drawing 5] It is the plan of a five views view in drawing 4 in the state where the mirror assembly was removed.

[Drawing 6] It is the side elevation of the circumference check equipment for

automobiles of this invention.

[Drawing 7] It is the plan of a seven views view in drawing 6 .

[Drawing 8] It is the plan of switching equipment.

[Drawing 9] As for explanatory drawing of the screen of a monitoring device in case camera equipment is located in a front position, and (B), camera equipment of (A) is explanatory drawing of the screen of the monitoring device when being located in a back position.

[Drawing 10] It is the circuit diagram of the control circuit section when being located at the time at which camera equipment is located in a back position.

[Drawing 11] It is the circuit diagram of the control circuit section when camera equipment is rotating in the front position from the back position.

[Drawing 12] It is the circuit diagram of the control circuit section when camera equipment is located in a front position.

[Drawing 13] It is the circuit diagram of the control circuit section when camera equipment is rotating in the back position from the front position.

[Drawing 14] It is flat-surface explanatory drawing which showed the 2nd operation gestalt of the circumference check equipment for automobiles of this invention, and expressed the check range.

[Drawing 15] It is side explanatory drawing showing the check range.

[Drawing 16] It is the side elevation of door mirror equipment and the circumference check equipment for automobiles of this invention.

[Drawing 17] It is the side elevation of the circumference check equipment for automobiles of this invention in the state where covering was removed.

[Drawing 18] It is the plan of a 18 views view in drawing 17 in the state where the mirror assembly was removed.

[Drawing 19] It is the side elevation of the circumference check equipment for automobiles of this invention.

[Drawing 20] It is the plan of a 20 views view in drawing 19 .

[Drawing 21] It is the plan of switching equipment.

[Drawing 22] As for explanatory drawing of the screen of a monitoring device in case, as for explanatory drawing of the screen of a monitoring device in case camera equipment is located in a front position, and (B), camera equipment is located in a lower part position, and (C), camera equipment of (A) is explanatory drawing of the screen of the monitoring device when being located in a back position.

[Drawing 23] It is the circuit diagram of the control circuit section when being located at the time at which camera equipment is located in a lower part position.

[Drawing 24] It is the circuit diagram of the control circuit section when camera

equipment is rotating in the front position from the lower part position.

[Drawing 25] It is the circuit diagram of the control circuit section when camera equipment is located in a front position.

[Drawing 26] It is the circuit diagram of the control circuit section when camera equipment is rotating in the lower part position from the front position.

[Drawing 27] It is the circuit diagram of the control circuit section when camera equipment is rotating in the back position from the lower part position.

[Drawing 28] It is the circuit diagram of the control circuit section when camera equipment is located in a back position.

[Drawing 29] It is the circuit diagram of the control circuit section when camera equipment is rotating in the lower part position from the position.

[Drawing 30] It is the side elevation of the circumference check equipment for automobiles of this invention in the state where the 3rd operation gestalt of the circumference check equipment for automobiles of this invention was shown, and door mirror equipment and covering were removed.

[Drawing 31] It is the plan of a 31 views view in drawing 30 in the state where the mirror assembly was removed.

[Drawing 32] It is the side elevation of the circumference check equipment for automobiles of this invention.

[Drawing 33] It is the plan of a 33 views view in drawing 32 .

[Drawing 34] It is a 34-34 line cross section in drawing 33 .

[Drawing 35] It is a 35-35 line cross section in drawing 33 .

[Drawing 36] It is a 36-36 line development in drawing 33 .

[Drawing 37] a part of supporting structure — it is a perspective diagram

[Drawing 38] The modification of the 3rd operation gestalt of the circumference check equipment for automobiles of this invention is shown, and they are drawing 34 and a corresponding cross section.

[Drawing 39] They are drawing 35 and a corresponding cross section.

[Drawing 40] They are drawing 36 and a corresponding development.

[Drawing 41] The 4th operation gestalt of the circumference check equipment for automobiles of this invention is shown, and it is the side elevation of the circumference check equipment for automobiles of this invention.

[Drawing 42] It is the plan of a 42 views view in drawing 41 .

[Drawing 43] It is the rear view which 43 view view in drawing 41 fractured the part.

[Drawing 44] The 5th operation gestalt of the circumference check equipment for automobiles of this invention is shown, and it is a 44-44 line cross section in drawing 6 , drawing 19 , drawing 33 , and drawing 41 .

[Drawing 45] It is a 45-45 line view view in drawing 44 .

[Drawing 46] The 6th operation gestalt of the circumference check equipment for automobiles of this invention is shown, and it is a cross section corresponding to drawing 44 .

[Drawing 47] It is a 47-47 line view view in drawing 46 .

[Drawing 48] The 7th operation gestalt of the circumference check equipment for automobiles of this invention is shown, and it is the side elevation of the circumference check equipment for automobiles of this invention.

[Drawing 49] It is a 49-49 line cross section in drawing 48 .

[Drawing 50] The main dead angles around the automobile by viewing of a driver are shown, and side explanatory drawing [in / (A) / (A) and / in (B)] of B view view and (C) are transverse-plane explanatory drawings of C view view in (A). / flat-surface explanatory drawing

[Drawing 51] The main dead angles by check by looking of door mirror equipment are shown, and it is side explanatory drawing [in / (A) / A and / in (B)] of B view view. / flat-surface explanatory drawing

[Description of Notations]

1 [— The area pellucida, 103 / — Water absorption eradication member,] — The mirror base, 100 — Covering, 102 2 [— Camera equipment (image pick-up equipment),] — 3 A mirror assembly, 8 — The control circuit section, 4 5 [— The guide section, 64 / — Friction clutch mechanism,] — A monitoring device, 6 — A mechanical component, 61,610 68 [— Supporting structure,] — A ball clutch mechanism, 7,700,900 — A rotation shaft, 70,701 9 [— An eye point, C, C' / — Dead angle,] — The posture orthodontic appliance, A — An automobile, EP D [— The range, F1, F2 F3, F4 which can be checked by looking with door mirror equipment / — The circumference check equipment for automobiles of this invention M / — A motor, H-H / — A horizontal axis, SW, SW' / — Control switch.] — A door, DM — Door mirror equipment, E